

same dissociation is produced by a temperature (138° C.) very little above its boiling point. No salts derived from it have yet been obtained; but the authors regard it as *diacetyl nitric acid* $(CH_3CO)_2O_2N(OH)_2$, a derivative of ortho-nitric acid $N(OH)_3$. It reacts on many organic compounds, producing in some cases nitro or acetyl derivatives, in others oxidation products. These products are usually different from those produced by nitric acid alone, and the frequently occurring difference between the results of acting with nitric acid on a substance directly and in acetic-acid solution are possibly explained by the preliminary formation of diacetyl nitric acid.

Cf the other acids of the acetic series, propionic seems to be the only one which forms a corresponding derivative with nitric acid.—J. T. D.

Tetramethyl Ammonium; Electrolytic Production of — W. Palmer. Zeits. f. Elektrochem., 1902, 8, [38], 729—731.

EXPERIMENTS in the direction of isolating ammonium by the electrolysis of solutions of ammonium salts in liquid ammonia at low temperatures have failed, owing to the spontaneous decomposition of the NH_3 into ammonia and hydrogen. The author has tried to isolate tetramethyl ammonium by an analogous method, and has obtained a transient blue colour at the cathode, exactly similar in appearance to the solution of sodium in fluid ammonia. It is assumed that this blue liquid contains tetramethyl-ammonium dissolved in ammonia, and that it is rapidly attacked by oxygen. All attempts to separate it from the solution have failed. The substance used was either the hydroxide (which could not be obtained quite free from chloride) or the chloride; this was dissolved in pure ammonia and electrolysed with platinum electrodes in a Dewar's double-walled vessel with the space between the walls exhausted. The temperature was $-41^\circ C$. A pressure of 30 volts yielded a current of 0.6 ampère when the solution was saturated. The blue colour was formed immediately, but its formation ceased when ammonium chloride was formed by the agency of anode chlorine, this salt being then electrolysed instead of the tetramethyl ammonium compound.—W. G. M.

Gentiobiose; Action of Soluble Ferments and Top-fermentation Beer Yeast on — Remarks on the Constitution of Gentiobiose. E. Bourquelot and H. Herissey. Comptes Rend., 1902, 135, [9], 399—401.

The action of soluble ferments upon gentianose having been studied (this Journal, 1898, 592, and 1901, 386), the authors have now turned their attention to the hydrolysis of gentiobiose (this Journal, 1902, 1159).

The liquid obtained from cultures of *Aspergillus hydrolyses* gentiobiose completely, two molecules of glucose being formed. Invertase has no action on gentiobiose. Emulsin hydrolyses gentiobiose completely, but not gentianose. The action of emulsin on gentianose has been further studied; after a long time the liquid develops slight cupric reducing properties and the dextro-rotation is slightly increased. Hence the emulsin of almonds probably contains traces of an enzyme capable of splitting gentianose into glucose and a sugar of the nature of cane sugar.

Top-fermentation beer yeast neither hydrolyses nor ferments gentiobiose, and constitutes a convenient means for removing fructose from the impure hydrolytic products containing gentiobiose.

Constitution of Gentiobiose.—There are four polysaccharides known which are attacked by invertase: cane sugar, raffinose, gentianose, and mannoctetose. In all these cases one molecule of fructose is split off. It is suggested that only those polysaccharides, which contain a molecule of fructose united to a molecule of glucose in the same way as in cane sugar, are attacked by invertase in this way, and that gentianose therefore contains the cane sugar linkage. To hydrolyse gentianose completely (and probably all polysaccharides), several enzymes are necessary, in this case, invertase and emulsin. The action of the two

is not simultaneous, the emulsin cannot act until the invertase has split up the trisaccharide into fructose and gentiobiose.—J. F. B.

New Books.

THE ELECTRO-PLATING AND ELECTRO-REFINING OF METALS. Being a New Edition of Alexander Watt's "Electro-deposition." Revised and largely re-written by ARNOLD PHILIP, A.R.S.M., &c. Crosby Lockwood and Son, 7, Stationers' Hall Court, Ludgate Hill, London, E.C. 1902. Price 12s. 6d.

8vo volume, containing frontispiece, prefaces, tables of contents, 660 pages of subject-matter, illustrated with 160 engravings, and indexes of subject-matter and authors. The work is divided into two parts: I. ELECTRO-PLATING; II. ELECTRO-METALLURGY. These are again subdivided under the following headings:—(i.) Primary and Secondary Batteries. (ii.) Thermopiles, Dynamos, &c. (iii.) History of Electro-deposition. (iv. to viii.) Electro-deposition of Copper. (ix. to xi.) Deposition of Gold by Simple Immersion. (xii.) Various Gilding Operations. (xiii.) Mercury Gilding. (xiv. to xvi.) Electro-deposition of Silver. (xvii.) Imitation Antique Silver. (xviii. to xx.) Electro-deposition of Nickel. (xxi.) Deposition and Electro-deposition of Tin. (xxii.) Electro-deposition of Iron and Zinc. (xxiii.) Electro-deposition of Various Metals. (xxiv. and xxv.) Electro-deposition of Alloys. (xxvi.) Recovery of Gold and Silver from Waste Solutions, &c. (xxvii.) Mechanical Operations connected with Electro-deposition. (xxviii.) Materials used in Electro-deposition. Two Appendixes on Electro-plating.

II. ELECTRO-METALLURGY. (i.) Electro-metallurgy of Copper. (ii.) Cost of Electrolytic Copper Refining, &c. (iii.) Electrolytic Copper Refineries. (iv.) Electrolytic Gold and Silver Bullion Refining. (v.) Electrolytic Treatment of Tin. (vi.) Electrolytic Treatment of Lead. (vii.) Electrolytic Production of Aluminium and the Electrolytic Refining of Nickel. (viii.) Electro-galvanising.

THE CHEMISTRY OF THE TERPENES. By F. HEUSLER, Ph.D. Authorised Translation by FRANCIS J. POND, M.A., Ph.D., Assistant Professor in the Pennsylvania State College. J. and A. Churchill, 7, Great Marlborough Street, London. 1902. Price 17s.

8vo volume, containing dedication (to Prof. O. Wallach), prefaces, tables of contents, 435 pages of subject-matter, and the alphabetical index. The subject-matter is subdivided as follows:—INTRODUCTION. SPECIAL PART. Hemiterpenes. Terpenes Proper. Hydrocarbons. I. Oxidised Compounds related to the Terpenes, $C_{10}H_{16}$. II. Compounds regarded as Derivatives of the Hydrocymenes. Amido-derivatives of the Terpenes. I. Bases regarded as Derivatives of the Hydrocymenes. II. Bases which may be regarded as Derivatives of the Hydrocymenes. Amido-derivatives of Phellandrene. Olefinic Members of the Terpene Series. Sesquiterpenes and Polyterpenes. Diterpenes. Triterpenes and Tetraterpenes.

THE ANALYSIS OF STEEL-WORKS MATERIALS. By H. BREARLEY and F. INNOTSON. Longmans, Green, and Co., 39, Paternoster Row, London, E.C.; also New York and Bombay. 1902. Price 14s. nett.

This work, of 8vo size, contains dedication (to Dr. H. C. Sorby, F.R.S., &c.), preface, table of contents, and subject-matter filling 351 pages, an appendix giving a Bibliography of Steel-Works Analyses by N. Brearley, with preface, table of contents, and text extending from page 359 to 495. A general alphabetical index concludes the work. With regard to the contents of the body of this work, the subdivision is as follows:—I. Analysis of Steel. II. Analysis of Pig Iron. III. Analysis of Steel-making Alloys. IV. Rapid Analysis at the Furnace. V. Analysis of Ores. VI. Analysis of Refractory Materials (Acid Materials, Neutral

Materials, and Basic Materials). VII. Analysis of Slags. VIII. Analysis of Fuel. IX. Boiler Water, Boiler Scales, &c. X. Analysis of Engineering Alloys. XI. Micrographic Analysis of Steel. XII. Pyrometry. XIII. Miscellaneous Notes. There are 85 illustrations. With regard to the contents of the Bibliography of Steel-Works Analysis, these are subdivided as follows:—Carbon. Silicon. Manganese. Sulphur. Phosphorus. Chromium. Nickel. Cobalt. Tungsten. Molybdenum. Vanadium. Titanium. Aluminium. Copper. Iron.

DIE CHEMISCHE INDUSTRIE DES DEUTSCHEN REICHES IM BEGINNE DES ZWANZIGSTEN JAHRHUNDERTS. Eine Festschrift zum fünfundzwanzigjährigen Jubiläum der Begründung des Vereins zur Wahrung der Interessen der Chemischen Industrie Deutschlands. Von Dr. Otto N. Witt, Prof. der techn. Chemie an der königl. technischen Hochschule zu Berlin. 1877—1902. R. Gaertner's Verlagsbuchhandlung, Hermann Heyfelder, Schönebergerstr. 26, Berlin, S.W. 1902. Price M. 10.

470 volume containing table of contents and introduction; with text, filling 229 pages. The subject-matter is treated under the following headings:—I. The Chemical Industry of Germany as a whole, its field of Operations and its Present Extent: A. Conditions of Existence and Extent. B. The German Chemical Industry and the World's Exhibitions. II. The German Chemical Industry in its Individual Sections: A. The Acids, Alkalis, and Salts, as also the Artificial Manures. B. The Industry of Chemical Preparations:—INORGANIC: (1) Bromine and Bromine Compounds. (2) Iodine. (3) Sulphites, Thiosulphates, Hydrosulphites, and Sulphides; also Persulphates. (4) Phosphorus, Arsenic, and Antimony Compounds. (5) Boric Acid and Borax. (6) Water-glass. (7) Cyanogen Compounds and Derivatives. (8) Metallic Salts. CARBON COMPOUNDS: (1) Alcohol Preparations. (2) Preparations from the Aromatic Series. (3) Medicinal and Pharmaceutical Preparations, Alkaloids, and Drugs. (4) Photographic Preparations. The German Industry (Chemical Preparations) in the Paris Exhibition of 1903. C. The Glue and Gelatin Industry, also that of the Mineral and Pigment Colours. D. The Destructive Distillation Industry: (1) Distillation of Wood. (2) Distillation of Brown Coal. (3) Distillation of Coal. Statistical. E. Dyestuff Industry: (1) Present Condition. (2) Dyestuffs in the Collective Exhibition of German Chemical Industry in Paris, 1900. F. Perfumery Industry. Conclusion.

DIE CHEMISCHE INDUSTRIE IN DER DEUTSCHEN ZOLL- UND HANDELSGESETZGEBUNG DES NEUNZEHNTE JAHRHUNDERTS. Ein Beitrag zum Studium der deutschen Wirtschaftsgeschichte. Von GUSTAV MÜLLER; Kaiserl. Geh. Regierungsrat und vortragender Rat im Reichsamt des Innern. R. Gaertner's Verlagsbuchhandlung, Hermann Heyfelder, Schönebergerstr. 26, Berlin, S.W. 1902. Price M. 24.

470 volume, with preface, table of contents, and subject-matter filling 422 pages, followed by an alphabetical index. The division of subjects is as follows:—I. UP TO THE FOUNDATION OF THE ZOLLVEREIN. (i.) Prussian Laws. (ii.) Bavarian Law. (iii.) Saxon Law. (iv.) Würtemberg Law. (v.) Bavarian-Würtemberg Law. (vi.) Baden Law. II. FROM THE FOUNDATION OF THE ZOLLVEREIN TO THAT OF THE GERMAN EMPIRE. (i.) From 1834 to 1842. (ii.) From 1843 to 1853. (iii.) From 1853 to 1865. (iv.) From 1865 to 1870. (v.) Statistics of the Years 1832 to 1871. III. SINCE THE FOUNDATION OF THE GERMAN EMPIRE. (i.) From 1871 to 1879. (ii.) From 1880 to 1891. (iii.) From 1891 to the Present Day. (iv.) Statistics from 1872 to the Present Day. An Appendix follows. The work closes with an alphabetical index.

Trade Report.

I.—GENERAL.

GENERAL IMPORTS OF THE UNITED KINGDOM FOR THE YEARS 1900—1.

Annual Statement of Trade, Aug. 1902.

B.—Articles subject to Duty.

Articles, and Countries whence Imported.	Quantities.		Value.	
	1900.	1901.	1900.	1901.
Beer and Ale: Mum, Spruce, or Black Beer, Berlin White Beer, and other similar preparations, Total..	Barrels. 1,416	Barrels. 1,424	£ 8,819	£ 8,891
Of other Sorts: Foreign Countries .. British Possessions ..	51,546 258	51,062 41	144,324 697	154,786 06
Total	51,861	51,703	145,221	154,852
Chloral Hydrate, Total ..	Lb. 23,083	Lb. 35,472	5,458	3,999
Chloroform, Total	1,454	1,635	108	143
Cocoa or Chocolate, in the Manufacture of which Spirit has been used, Total	106,087	60,712	9,412	4,549
Collodion, Total	Galls. 1,203	Galls. 1,059	395	318
Ether: Acetic, Total	Lb. 5,294	Lb. 2,362	244	131
Butyric, Total	Galls. 1,854	Galls. 441	898	397
Sulphuric, Total	3,107	3,390	663	689
Ethyl: Bromide, Total	Lb. 43	Lb. 86	7	11
Chloride, Total	Galls. 449	Galls. 396	2,458	2,300
Iodide, Total	2	4	15	14
Soap, Transparent, in the Manufacture of which Spirit has been used, Total	Lb. 11,364	Lb. 9,404	511	535
Spirits: Rum: Foreign Countries .. British Possessions ..	Proof Galls. 1,494,247 4,762,390	Proof Galls. 1,323,315 5,368,756	116,077 366,451	83,405 421,502
Total	6,190,547	6,692,601	482,528	507,907
Rum, Imitation: Foreign Countries .. British Possessions ..	42,010 18	26,739 112	3,460 10	2,029 14
Total	42,034	26,851	3,470	2,043
Brandy: Foreign Countries .. British Possessions ..	2,566,139 36,126	3,067,018 11,507	1,195,771 10,036	1,384,450 4,181
Total	2,800,265	3,081,525	1,205,807	1,388,631
Geneva: Foreign Countries .. British Possessions ..	413,023 19	431,317 25	66,331 4	65,777 14
Total	413,042	431,342	66,335	65,791
Unenumerated, not Sweetened: Foreign Countries .. British Possessions ..	1,426,075 3,815	2,001,076 924	79,008 808	87,408 518
Total	1,429,910	2,001,994	79,810	88,040